ARITHMETIC.

Conducted by B. F. FINKEL, Springfield, Mo. All contributions to this department should be sent to him.

SOLUTIONS OF PROBLEMS.

74. Proposed by JOHN T. FAIRCHILD, Principal of Crawfis College, Crawfis College, Ohio.

When U. S. Bonds are quoted in London at $108\frac{3}{4}$ and in Philadelphia at $112\frac{1}{4}$, exchange $\$4.48\frac{1}{2}$, gold quoted at 107, how much more was a \$1000 U. S. bond worth in London than in Philadelphia?

Solution by G. B. M. ZERR, A. M., Ph. D., Texarkana, Arkansas.

If I understand the problem correctly, the exchange price is not necessary for the solution.

$\$1000 \times 1.12\frac{1}{4} = \$1122.50$, price in Philadelphia.

$\$1000 \times 1.08\frac{3}{4} = \$1087.50$, price in London.

But one dollar of London gold is worth \$1.07 of Philadelphia currency.

$\therefore \$1087.50 \times 1.07 = \$1163.62\frac{1}{2}$, price of London bond in U. S. currency.

$\therefore \$1163.62\frac{1}{2} - \$1122.50 = \$41.12\frac{1}{2}$, the amount the London bond cost an American more than the Philadelphia bond.

To find the difference in cost to an Englishman in London, we proceed as follows:

$\$1000 \times 1.12\frac{1}{4} = \$1122.50$.

$\$1122.53 \div 1.07 = \$1049.06\frac{58}{107}$, price of the Philadelphia bond in English gold.

$\$1000 \times 1.08\frac{3}{4} = \$1087.50$.

$\$1087.50 - \$1049.06\frac{58}{107} = \$38.43\frac{49}{107}$.

$\$38.43\frac{49}{107} \div \$4.89\frac{1}{2} = 7£\ 17s\ .433d$.

[We believe Dr. Zerr's view of this problem to be the correct one. EDITOR.]

77. Proposed by F. S. ELDER, Professor of Mathematics, Oklahoma University, Norman, Oklahoma.

For how many seconds must I count the clicking of the rails under a train that the number of rails counted may be equal to the speed of the train in miles per hour, a rail being 30 feet long.

I. Solution by FREDERIC R. HONEY, Ph. B., New Haven, Connecticut, and CHAS. C. CROSS, Laytonsville, Maryland.

This problem is similar to the one proposed in the July-August number, Vol. III. The result is independent of the number of rails counted and of the number of miles per hour the train is running.

In the problem referred to, the answer is $3a/88$ minutes during which the poles are counted, where a equals the number of yards the polls are apart.

In the present case, $a=10$ yards. Hence, substituting, $3a/88$ minutes$=$ 30/88 minutes$=20\frac{5}{11}$ seconds.